NDC-F18
Access Control Panel

Installation Manual

NDC-F18

A C C C E S S C O N T R O L P A N E L

This manual covers installation, programming and utilization of NDC-F18 access control panel. Read this manual carefully prior to installing and programming the unit.

Design Change Disclaimer

Due to design changes and product improvements, information in this manual is subject to change without notice. ITV reserves the right to change product design any time, which may subsequently affect the contents of this manual.

ITV assumes no responsibility for any errors that may appear in this manual. ITV will make every reasonable effort to ensure that this Installation/Programming Manual is up to date and corresponds with your shipped unit.

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Training and technical support

Integrated Technical Vision Ltd. performs training on the installation, programming and utilization of NDC-F18 access control panel. For additional information about training and discussing of your particular requirements to the unit please contact our personnel by the phone numbers below.

It is recommended to pass the training in Integrated Technical Vision Ltd. to personnel intended for sales and installation of NDC-F18 access control panel on permanent basis. Technical support for all products of Integrated Technical Vision Ltd. can be obtained at business time by the phones below:

+380 (0) 44 248 65 88

+380 (0) 44 248 65 89

+380 (0) 44 248 65 90

This support assumes the calls of trained specialists. End users must apply to their dealers or installers before calling us.

This information is available on our web site www.itvsystems.com.ua

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Preface

NDC-F18 access control panel is designed for use in access control systems. Primary goals of Access Control System are: identification of a person, confirmation or not confirmation of access, control of movements in a necessary zone. It can provide time and attendance logging, in addition to the usual task of restricting individuals' access to certain areas.

All users' access information is gathered by a server, where administrators can retrieve and analyze it. This data provides recording of staff movement within an organization, whether it is a small company or a company that employs thousands.

NDC-F18 panel operates as a total stand-alone unit with fully distributed database. All valid card numbers, time zones and relay pulse times are loaded into controller's memory. The panel controls access on two access points on a stand-alone basis with no dependency on central computer system. Control panels are connected via RS-485 dropline in Access Control Systems.

Features

- o Supports all Wiegand reader technologies
- o Distributed database for independent operation
- o Operates in remote site configurations with dial-up (requires NDC-B052)
- o 4-wire RS-485 communications, protection rated at 3000 V
- o RS-232 communication port for local programming
- o 8 supervised programmable inputs
- o Tamper switch contact
- o 4 Form C relays
- o Up to 255 time zones to control card access
- o Real time clock
- o PC programming
- o Local antipassback function

Specifications

Primary power supply	~220 $^{+22}_{-44}$ V, 50 hertz
Power consumption of alternate current net	25 VA
Secondary power supply:	10.8 V... 38 V of continuous current
	11V... 24 V of alternating current
Peak current	100 mA @ 12 V
Voltage ripple	500 mV @ 12 V
Inputs	8 programmable EOL supervised inputs
	2 inputs for battery and power state control
Outputs	Two 1 A @ 24 V relays
	Two 5 A @ 24 V relays
Networking	RS232/485 interface
Operation temperature	0° C … +55° C;
Relative Humidity	95% relative at +25° C;

Nonvolatile memory capacity is shown in the table below:

Identificators	4096
Events	8094
Time zones	250
Schedules	250
Holidays	250

Overall dimensions	300x310x80 mm
Weight	2,45 kg

Terms

Access point

Access point is a logical concept of the access control system implying the control of passing through the door in one direction. It consists of reader, access control panel (or it's part), door supervision devices (like magnetic contact, RTE etc.) and door locking device. For instance, the turnstile with two way passes has two **Access points** – one for entrance and the other one for exit, door of this type is called *double-sided* door. A door with the reader on one side has only one **Access point** – Entry point, and it is called *single-sided* door.

Antipassback

The Antipassback function is implemented in the NDC-F18 access control panel in order to prevent the situation when user gives his ID to another person after passing to the premises. If this function is on, NDC-F18 tracks an ID position – Inside or Outside the premises. On any attempt to pass in the same direction twice NDC-F18 denies access and stores "Access Denied, Antipassback" event into the Log.

The antipassback function can be set on, only in case of the double-sided door control.

Code matching

NDC-F18 can arise alarm in case of an attempt of a code (or ID) matching. The Code matching is considered when invalid code (or ID) entered several times. Valid code entrance clears the counter. This function switching on and number of code entrances are subjects of programming.

Door Contact (DC)

In access control systems various sensors are used to supervise the status (opened or closed) of the pass way – magnetic door sensor, sensor of the turnstile rotor position, inductive sensor of car passing through the road barrier, etc.

The Door Contact terminal of NDC-F18 is intended for connection of these sensors.

Door time

If the door contact is open, the corresponding access point goes into alarm. Alarm is not invoked, if the contact is opened during the Door Time interval of time. This interval starts when access is granted and lasts for the programmed time or terminates on opening and subsequent closing of the door contact.

Downloading

NDC-F18 is to be downloaded after setting all parameters – modes of inputs, outputs, access rights and others on the computer. During the downloading parameters are rewritten into the access control panel. If you change control panel parameters in your computer, they will not take effect until this parameters downloaded into the control panel.

PIN (Personal Identification Number)

Some readers have built-in keypad. The keypad may be used to enter ID in this

case. Usually this ID is named PIN (Personal Identification Number). It can be both self dependant or used as an additional code for ID. When this PIN is .

programmed as additional code, NDC-F18 waits for PIN entrance after the ID read-out. PIN is associated with ID.

Proximity Identificator

In access control systems each user has ID (identificator) with the unique code. Proximity ID's may be in shape of plastic card, key trinket, etc.

Reader

Readers are devices assigned for reading information from ID's and transmitting it to the control panel

There are several types of ID's and readers for them. It is essential that reader and control panel should use the same interface. NDC-F18 utilizes Wiegand interface.

RTE (Request to Exit)

To exit from the premises with a single-sided door, the button wired to the control panel is used. This button is called RTE (Request To Exit) button. If someone opens the door otherwise than pressing the RTE button – by reenergizing locking device, opening lock with a key etc., the Door Forced Open event arises.

RTE button may be used for remote door opening as well.

Schedules

NDC-F18 is capable to store up to 100 time zones. 100 week schedules can be combined from these time zones, including 70 holidays.

Moreover NDC-F18 can store several "floating" schedules, based on the period different to a week. The number of such "floating" schedules depends on the period length.

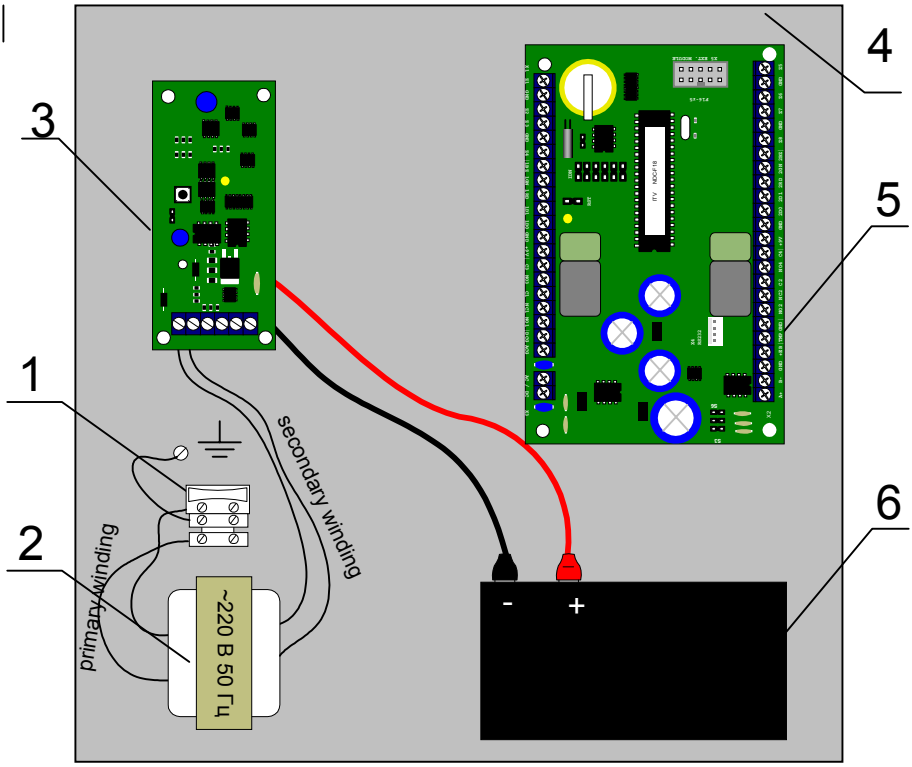
"Several ID's" access

To access the high security premises the presence of more than one person may be required . NDC-F18 allows assigning of up to 15 groups of people with the access rights. The access is granted only in case when one person from each group is present. For instance you have the room which can be attended only by the personnel of R&D department escorted with guard. You can form two groups for this access – group of R&D employees and group of guard. The access is granted if two ID's from different groups read on panel readers – one belongs to the R&D department employee and the other one – to a guardian.

Time zone

Any interval of time which has the beginning and the end.

What's inside



The layout of NDC-F18 is shown on picture below.

Figure 1 View of the Panel inside the box:

1 - Mains power connection terminal with fuse

2 - Transformer

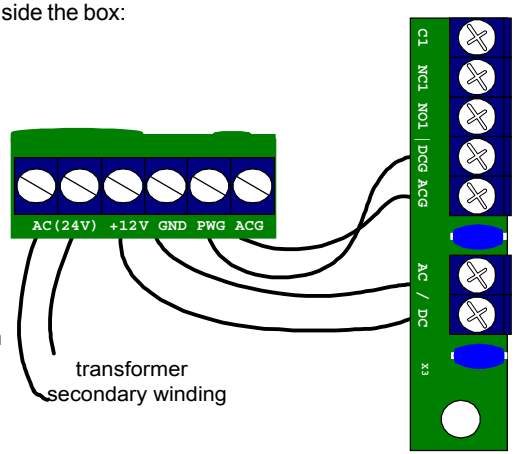
3 - Power supply plate

4 - Box

5 - Control panel baseplate

6 - Battery

The wiring of the power supply plate to the control panel base plate is shown on diagram to the right



Wiring diagram

Figure 2 NDC-F18 access control panel wiring

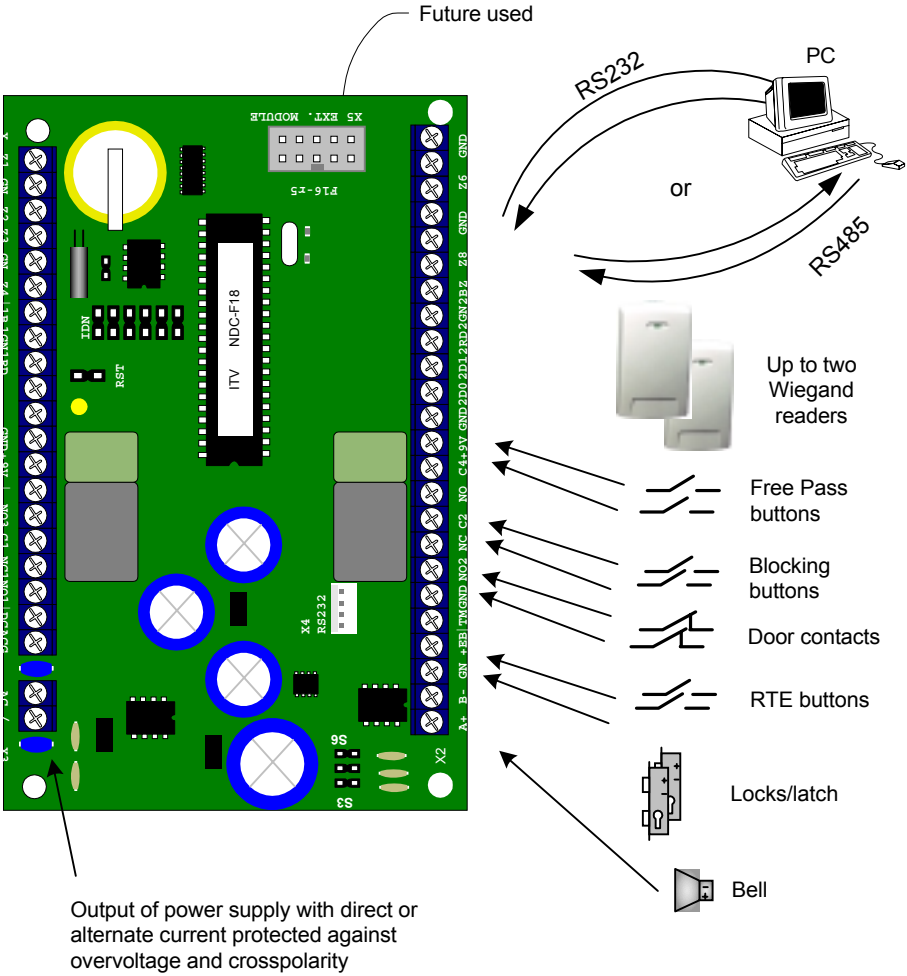
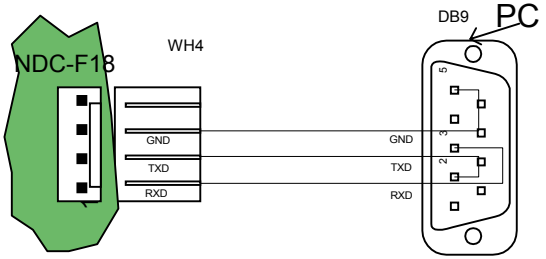


Diagram of null-modem cable, used for connection to PC is shown below:



Controls and connections on the board

Terminal	Name	Function
X1		
Z1	Z1	Terminals' for inputs connection
GND	GND	
Z2	Z2	
Z3	Z3	
GND	GND	
Z4	Z4	
1BZ	buzzer	Reader A terminals
1GN	green LED	
1RD	red LED	
1D1	data 1	
1D0	data 0	
GND	GND	
+9V	+9V	
C3	Common	Relay 3 terminals
NO3	Normally open	
C1	Common	Relay 1 terminals
1NC1	Normally closed	
NO1	Normally open	
ACG	Battery good	Power supply signals
PWG	220 power good	
X3		
AC/DC	Power	Direct or alternate power supply connection
X2		
A+	RS485-A+	RS485 dropline
B-	RS485-B-	
GND	GND	
+EB	Additional devices' power	
TMP	TMP	Tamper connection
GND	GND	
NO2	Normally open	Relay 2 terminals
NC2	Normally closed	
C2	Common	
NO4	Normally open	Relay 4 terminals
C4	Common	
+9V	+9V	Reader B terminals
GND	GND	
2D0	data 0	
2D1	data 1	
2RD	red LED	
2GN	green LED	
2BZ	buzzer	
Z8	Z8	Inputs' connection terminals
GND	GND	
Z7	Z7	
Z6	Z6	
GND	GND	
Z5	Z5	

Terminal assignment

Connectors

- X5 - Not Used - for future use
- X4 - RS-232 communication port

Jumpers and LED

- RST - Reset jumper
- S2 - Address of the control panel
- S3, S4, S6 Jumpers for RS-485 load selection
- BAT - Real-time clock' power switch.
- LED - Live function indicator (Yellow)

Set jumper BAT during panel installation and withdraw it for storage and transportation to avoid lithium battery discharge.

Control Panel Operation

Control panels are supplied unprogrammed. In this state reader's LEDs do not light. Yellow LED situated on PCB blinks 5 times per second. Panel does not respond to cards passing and inputs opening and closing. The panel should be downloaded to start the operation with DC Configurator or Golden Gate program.

Yellow LED starts to blink one time per second and switches to the main mode automatically after successful settings' downloading.

The panel can be turned to unloaded status only with command from PC, see programming instruction.

The panel can control two independent access points. Each access point may be in one of the four modes: main mode, alarm, blocked or free pass. Free pass mode has the highest priority, as panel switches to this mode in case of fire, then blocked, alarm and main modes follow.

Main Mode

Panel grants or denies access to cardholders in this mode. In main mode reader's LEDs blink red.

Access with ID

To access the premises cardholder passes RF ID to reader. If it is valid, panel grants access, unlocks the door and switches on green LED of the reader.

Access with ID and PIN

To access the premises cardholder passes RF ID to the reader. Panel checks up the necessity of PIN entry, and, if it is necessary, reader's LED blinks yellow, which means PIN is awaited. After valid PIN entry door is unlocked. Reader's LED lights green.

RTE button

To exit from the premises with single-sided door, user has to depress (press and release) Request To Exit button. Reader's LED lights green.

Outputs' use and operation modes

All outputs of the panel can be programmed at will one of the use variants: lock, bell, alarm or programmed output. Moreover every output is set an operational mode: start-stop (an output is activated whilst the proper command is present, for example, during the time of control panel Alarm mode), impulse (an output is activated for the programmed time), trigger (at first event an output is activated, at the next event it is switched off), and continuous.

Access Denial

Access may be denied to cardholder for the following reasons:

- Panel was not downloaded (reader's LED does not light or blink)
- ID was not enrolled in panel (on ID passing panel switches reader's red LED and buzzer for 1 second)
- ID expired (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Access is not allowed according to the schedule (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Antipassback violation (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Lost or Blocked ID passed (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Access point is in alarm mode (reader's red LED lights constantly)
- Access point is in blocked mode (reader's red LED lights constantly)

Alarm Mode

In alarm mode reader's red LED lights constantly.

Access point goes into alarm mode for following reasons:

- In case of door ajar
- Panel box tampering (both Access points)
- Attempt of access with lost ID
- If door is opened too long (door time expired)
- In case of attempt of code matching (if switched on during programming).

In alarm mode the panel activates outputs assigned for BELL and ALARM. Alarm output is deactivated when panel switches into the mode different from alarm mode and BELL output is deactivated after programmed time.

If access point is in alarm mode to pass through this point is prohibited. RTE button unlocks the door.

To switch alarm mode off, pass card with "Alarm OFF" sign or with command from computer.

Free Pass mode

Sometimes the conditions arise when door should be opened for free pass for everyone, in case of fire, earthquake or other disaster, for instance. For this case panel has free pass mode.

In the free pass mode reader's LED blinks red and yellow alternately.

Access point switches into free pass mode at operator's command or when input, programmed as "FREE PASS" is open. Access point remains in free pass mode until this input is open or until operator cancels this mode.

While Access point is in free pass mode the locking device is in unlocked state and panel does not respond to ID passing, PIN entry or RTE button pressing.

Blocked mode

The blocked mode is designed for situations when access to the premises should be prohibited for everyone, in case of security alarm for instance. When access point is in blocked mode access is granted to cardholders of IDs with "Security Service" sign. Door cannot be unlocked with RTE button.

When access point is in blocked mode reader's LED blinks red and green alternately.

Access point switches into blocked mode by operator's command or when input, programmed as "BLOCKING" is open. Access point remains in blocked mode until this input is open or until operator cancels the mode.

Mounting

NDC-F18 is delivered in the rugged metal box with rechargeable battery. Mount the panel in place, convenient for service.

To mount the panel on a wall proceeds as follows:

- Open box cover, place the box in the required position on a wall and mark the holes for mounting screws, using backplate as a template;

- pass the wires through the holes on a back plate,

- fasten the frame,

- connect the wires.

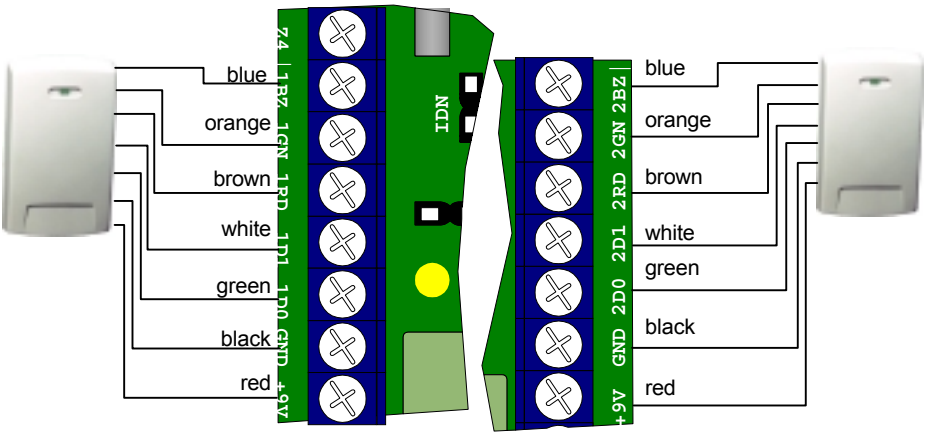
Set jumper S7 during control panel mounting before programming. Withdraw jumper 7 for long-term storage and transportation.

Wiring

Readers' connection

NDC-F18 has two sets of terminals for Wiegand readers' connection. The wiring is shown on Figure 3 Reader connection.

Figure 3 Readers' connection



Wire colors' correspondence:

white - data 1

green - data 0

blue - buzzer

brown - red LED

orange -green LED

black - GND

red - +9V

The wires' colors can differ in readers from other vendors. Please refer to reader's Installation manual.

Inputs' wiring

NDC-F18 has eight EOL inputs. All inputs are programmable. Their functions are set during programming.

The possible inputs' functions are:

- door contact,
- RTE button,
- door contact and RTE button,
- free pass (A, B, A+B)
- blocking (A, B, A+B)
- state monitoring

After reset to factory defaults all inputs become unassigned and not supervised. All inputs supervise shortage and break. The EOL usage is mandatory.

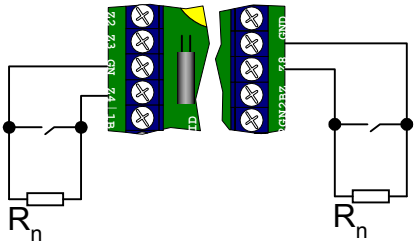
Input normal state is from 1,4 kOm up to 3 kOm. Input short circuit is less than 1,4 kOm and input break is more than 3 kOm.

RTE button

Request To Exit (RTE) button is to be used for one - sided door. In this case the door opens on depressing of RTE button for exit.

RTE button may be used for remote door opening - secretary or guard can open the door, for instance.

On the diagram to the right wiring of normally opened RTE button contacts is shown. RTE is wired to Z4 and Z8 terminals.



RTE button of access point A

RTE button of access point B

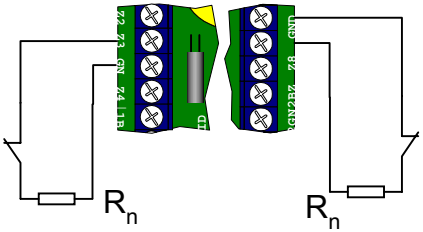
Usage of the deblocking button on the electric lock instead of RTE will cause "Door Forced" event.

So that the panel could work properly set attached inputs as RTE button inputs.

Door Contact

Door state (opened or closed) is determined by the status of door contact. If door contact is not connected, the panel is not able to determine the events of door force or not closed door.

The wiring of door contacts (normally closed) to Z3 and Z7 terminals is shown on wiring diagram.



Door contact of access point A

Door contact of access point B

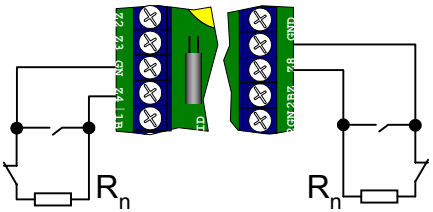
So that door contact could work properly set attached inputs as door contact inputs.

Provide a door under system control with door closer.

Door contact and RTE button

Control panel inputs can be programmed for simultaneous use of RTE button and door contact.

Input break means Door contact violation and input shortage means RTE button pressing.



Door contact and RTE button of access point A

Door contact and RTE button of access point B

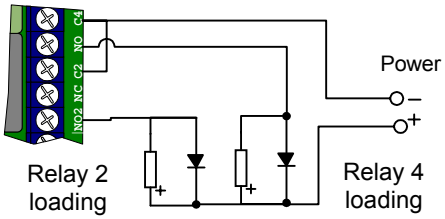
Any of eight inputs can be programmed as combined one, that is for simultaneous use of door contact and RTE button.

Free Pass and Blocking

Owing to the fact that any input may be programmed for Free Pass or Blocking the control panel can be easily integrated to intruder alarm system.

If the input is programmed for Free Pass, Free Pass Door A or Free Pass Door B then shortage or opening of this input unlocks the corresponding locking device and personnel can pass the door freely.

If the input is programmed for Blocking, then shortage or opening of this input denies access rights to all cards, except those with "Security service" mark.



Executive devices

NDC-F18 has four relay outputs to control operation of executive devices, that can be electric locks, turnpike, turnstile, bell, and so on.

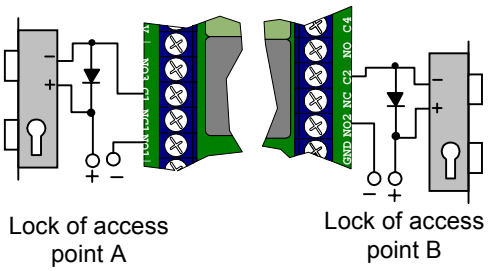
Relay 1 and 2 have normally open and normally closed contacts rating 5 A @ 24 V. Relay 3 and 4 have normally open contacts rating 1A@ 24V.

Do not use diodes when executive devices are attached to alternate current net.

When selecting power supply for the control panel mind that its capacity should correspond to power consumption of the control panel and executive devices.

Locking devices

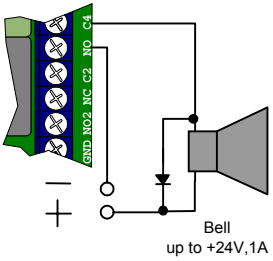
NDC-F18 has two relay outputs with form C contacts. The operation time of these outputs may be programmed from 1 to 255 sec, which allows controlling of any type of locking device.



Commutation of the inductive load, electric lock for instance, causes high energy electric impulse induced through relay contacts. To save the contacts from damage, protect them with diode, connected in reverse to current supply of the coil.

Note the fact, that some cheap electric door strikes are not intended for been energized for a prolonged time. Program relay time as short as possible to avoid door strike coil overheating.

Sirens, Bells and agents



When connecting a bell study carefully user manual of the bell.

Consumption power of the bell should not exceed 1A.

Some sirens require polarity observing.

Often Electric bells are the inductive load for power supply. Connecting the bells observe the warning about the inductive load above.

So that the siren could work properly set attached relay output as siren output while programming.

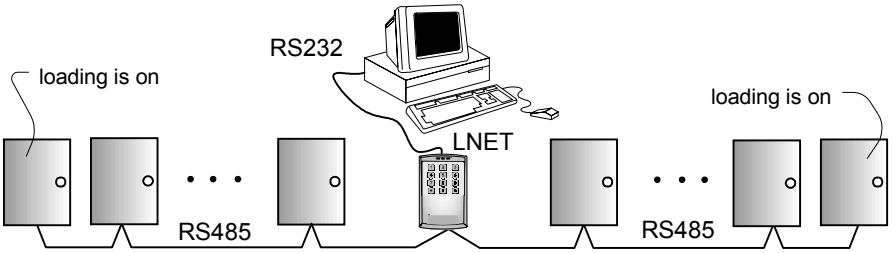
RS-485 Interface

RS-485 Interface is used for networking of the system components - PC and panels. The range of RS-485 bus is up to 1200 meters. The number of devices in one bus segment is up to 32.

RS-485 port is protected against overvoltage (60 V) and crosspolarity.

The unshielded four-wire cable may be used for RS-485 wiring. For maximal range of 1200 meters please use 0.4 mm2 cross section wire. 0.2 mm2 cross section wire will provide the range of 500 meters.

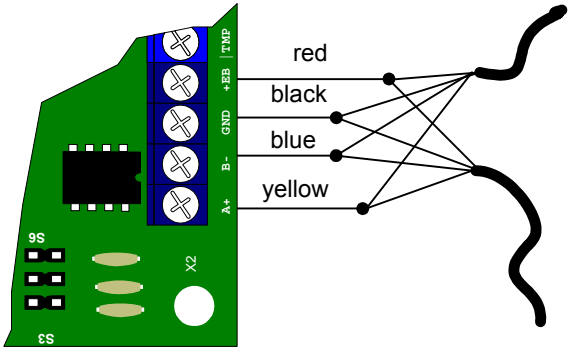
On the first and the last panel in the dropline short jumpers S3, S4 and S6, which connect loading resistors:



Take care of proper grounding of all panels in the network.

RS485 cables are connected to +A and B- GND and +EB contacts.

Connect wires of one color always to the same terminal, for example blue-colored wire always connect to terminal A.



Address settings

Each panel on RS-485 dropline must have the unique address from 0 to 31. To adjust the panel address, use the S2 jumpers set.

Address	Jumpers					
	S2.6	S2.5	S2.4	S2.3	S2.2	S2.1
0	+	+	+	+	+	+
1	+	+	+	+	+	-
2	+	+	+	+	-	+
3	+	+	+	+	-	-
4	+	+	+	-	+	+
5	+	+	+	-	+	-
6	+	+	+	-	-	+
7	+	+	+	-	-	-
8	+	+	-	+	+	+
9	+	+	-	+	+	-
10	+	+	-	+	-	+
11	+	+	-	+	-	-
12	+	+	-	-	+	+
13	+	+	-	-	+	-
14	+	+	-	-	-	+
15	+	+	-	-	-	-
16	+	-	+	+	+	+
17	+	-	+	+	+	-
18	+	-	+	+	-	+
19	+	-	+	+	-	-
20	+	-	+	-	+	+
21	+	-	+	-	+	-
22	+	-	+	-	-	+
23	+	-	+	-	-	-
24	+	-	-	+	+	+
25	+	-	-	+	+	-
26	+	-	-	+	-	+
27	+	-	-	+	-	-
28	+	-	-	-	+	+
29	+	-	-	-	+	-
30	+	-	-	-	-	+
31	+	-	-	-	-	-

"+" - jumper is shorted;

"-" - Jumper is open

Limited Warranty

Integrated Technical Vision Ltd. warrants that for a period of eighteen months from the date of purchase, the product shall be free of defect in materials and workmanship under normal use and that in fulfillment of any breach of such warranty, Integrated Technical Vision ltd. shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not damaged incurred in shipping or handing, or damaged due to causes beyond the control of Integrated Technical Vision Ltd. such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

The foregoing warranty shall apply only to the original buyer, and is and shall be lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of Integrated Technical Vision Ltd. This warranty contains the entire warranty. Integrated Technical Vision Ltd. neither assumes, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any warranty or liability concerning this product.

In no event shall Integrated Technical Vision Ltd. be liable for any direct, indirect or consequential damages. Loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation or operation or failure of this product.

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